CLAIMS

WHAT IS CLAIMED IS:

1	1. A charge pump circuit, comprising:
2	a replica circuit that provides a current difference between charge (UP)
3	and discharge (DN) currents; and
4	a buffer coupled to the replica circuit to buffer a received control voltage.
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1	2. A charge pump circuit for use in a phase-lock loop circuit, the
2	charge pump circuit comprising;
3	a charge pump core circuit that outputs a control voltage;
4	a replica circuit that is coupled to the charge pump core circuit, wherein
5	the replica circuit receives the control voltage and produces one or more bias
6	signals that are coupled to the charge pump core circuit to minimize the difference
7	between charge up and charge down currents generated by the charge pump core
8	circuit.
1	3. The charge pump circuit of claim 2, further comprising a buffer
2	circuit that is coupled to receive the control voltage and output the control voltage
3	to the replica circuit.
	4. The charge pump circuit of claim 3, further comprising one or
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2	more error amplifiers that are coupled to the replica circuit and the buffer circuit,
3	the one or more error amplifiers operate to output the one or more bias signals.
1	5. The charge pump circuit of claim 2, further comprising:
2	a servo circuit coupled to the replica circuit to receive at least one bias
3	signal; and
	a driver circuit coupled between the servo circuit and the charge pump
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5	core circuit.

1	6. A method for operating a charge pump circuit in a phase-lock loop
2	circuit, the method comprising:
3	generating an output control voltage at a charge pump core circuit;
4	generating one or more bias signals based on the control voltage; and
5	adjusting the operation of the core circuit based on the one or more bias
6	signals so as to minimize a difference between charge up and charge down
7	currents.
1	7. The method of claim 6, wherein the step of generating the one or
2	more bias signals comprises:
3	receiving the control voltage at a buffer circuit that outputs a version of
4	the control voltage;
5	receiving the version of the control voltage at a replica circuit that
6	generates the one or more bias signals based on the control voltage.
1	8. The method of claim 7, further comprising:
2	generating a current difference based on the version of the control voltage;
3	and
4	generating the one or more bias signals based on the current difference.
1	9. A charge pump circuit for use in a phase-lock loop circuit, the
2	charge pump circuit comprising;
3	a charge pump core circuit means for outputting a control voltage;
4	a replica circuit means for receiving the control voltage and producing one
5	or more bias signals that are coupled to the charge pump core circuit means to
6	minimize the difference between charge up and charge down currents generated
7	by the charge pump core circuit means.
1	10. The charge pump circuit of claim 9, further comprising a buffer
2	circuit means for receiving the control voltage and outputting a version of the
3	control voltage to the replica circuit means.

1	11. The charge pump circuit of claim 10, further comprising one or
2	more error amplifiers means for receiving the version of the control voltage and
3	outputting the one or more bias signals.
1	12. The charge pump circuit of claim 9, further comprising:

12. The charge pump circuit of claim 9, further comprising: a servo circuit means for receiving the at least one bias signal; and a driver circuit means coupled to the servo circuit means.

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